

The claims remaining in the application are 1-3, 5-10, 12-15, 17-20 and 22-23.

#### REMARKS

The Applicant would like to thank the Examiner for the courteous and *very* quick final Office Action. The Applicant further appreciates the entrance of the formal drawings and the Information Disclosure Statement.

#### Claim Rejections Under 35 U.S.C. §112, Second Paragraph

The Examiner rejected claims 14-23 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter that the Applicant regards as the invention.

In claims 14 and 20, the Examiner contends that it is unclear what is the intended scope of the claims. Said claims set forth "at least one polymer forming a gel" and within the same claim "at least one aminocarboxylic acid or a salt thereof in an effective amount to subsequently directly break down the gel". The Examiner asserts that it is unclear what form the aqueous fluid takes since the claims recite both the formation of a gel and an effective amount of an agent to break down said gel.

The Examiner further helpfully responds by asserting that it is unclear from the language of these methods what compositions are sought for patentability. The compositions have a physical transformation from gel to liquid based on the addition of a gel breaking fluid. The Examiner finds it unclear whether Applicant is claiming the gel, a broken gel (*i.e.*, liquid) or some transitory state between the two.

Applicants do not define the term cross-linking and/or crosslinker in the claims. The specification indicates borate cross-linked guar gum. The Examiner contends that said cross-linking and/or cross linker would include polyvalent metal ions common to ground water compositions, *e.g.* Fe, Al, Ca and Mg among others. The scope of cross-linker or cross-linking ion is indefinite because it is unclear whether said limitation excludes organic cross-linkers or cross-linkers other than borates.

Regarding the cross-linkers, the Examiner further finds it unclear whether said limitation excludes ground water polyvalent metal ions common to hard water.

The Applicant appreciates the Examiner pointing out these concerns.

With respect to the form of the aqueous fluid, the Examiner's attention is respectfully directed to the amendments to claims 14 and 20 where the following clarification has been made: "at least one guar or derivatized guar polymer capable of forming an aqueous gel". Support for the "guar or derivatized guar" additions in the claims is found in the application as filed in lines 18-20 of page 4 and thus do not constitute improper insertions of new matter. Support for the "capable of" additions in the claims is found in the application as filed in paragraph [0019], lines 7-24 of page 4, particularly line 16, and thus also do not constitute improper insertions of new matter. These amendments were made only to correct inadvertent clerical matters and not for any substantial reason related to patentability. The Applicant regrets any confusion the inadvertent errors may have caused.

The Applicant would respectfully submit that the clear intent of the invention is that claims 14 and 20 are addressed to a *fluid* (recited) that over time forms a gel, and which gel is subsequently broken. The aqueous fluid takes the form of a *fluid* as claimed, although, as also recited, it contains a polymer capable of forming a gel. This general process of an aqueous fluid later gelling and then the gel still later being broken is well known in the fracturing art, it is respectfully submitted. For instance, the Examiner's attention is respectfully directed to paragraphs [0003-0004] on pages 1-2 in the Background of the Invention in the instant specification. It is respectfully submitted that these amendments clarify what form the aqueous fluid takes and therefore overcome this point of rejection.

Additionally, the Examiner's attention is respectfully directed to the amendments to claims 15 and 20 herein where the crosslinker whose absence is noted is a *borate* crosslinker. Support for this recitation is found in the application as filed on page 5, lines 3-4 and elsewhere. These amendments were made only to correct inadvertent clerical matters and not for any substantial reason related to patentability. The Applicant regrets any confusion the inadvertent errors may have caused. The Applicant respectfully submits that these amendments clarify the crosslinker in the claims and thus overcome this point of rejection.

Again, if these explanations are unclear, the Examiner is invited to be more explicit about his concerns. Reconsideration is respectfully requested.

35 U.S.C. §102 Rejection Based on Lai, et al.

The Examiner has rejected claims 1-2, 5-7, 9, 12, 14, 17, and 18 under 35 U.S.C. 102(e), as being allegedly anticipated by U.S. Pat. No. 6,265,355 to Lai, et al.

The Examiner finds that Lai, et al. discloses the addition of aminocarboxylic acid salts to cross-linked polyacrylamide gels for the purpose of breaking said gels.

The Examiner further notes that the Applicant asserts that Lai, et al. acts on the cross-linker and not on the polymer. Since the claims employ open language "comprising", the Examiner asserts that the instant claims do not exclude said agents from also acting on the cross-linkers. The Examiner notes that the compositions are an equilibrium system and the skilled artisan would have expected the breaker agents to act on the gels that include both the polymers and the cross-linkers.

The Applicant must respectfully traverse.

It is respectfully submitted that a patent claim is anticipated, and therefore invalid, only when a single prior art reference discloses each and every limitation of the claim. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047, 34 U.S.P.Q.2d 1565 (Fed. Cir.), cert. denied, 116 S.Ct. 516 (1995). As will be explained, Lai, et al. does not disclose each and every limitation of the rejected claims, as amended.

The invention herein concerns the discovery that aqueous fluids comprising a guar or derivatized guar polymer gel can have that gel broken using one aminocarboxylic (or a salt thereof) because the single acid directly breaks down the gel, rather than attacking, removing or otherwise affecting the crosslinker. The Examiner's attention is respectfully directed to the fact that all claims herein have been amended to recite that the polymer is a guar or derivatized guar polymer. Support for this language is found on page 4, lines 18-20 of the application as originally filed and thus these amendments do not constitute improper insertion of new matter.

It is respectfully submitted that Lai, et al. do not teach or suggest the use of guar or derivatized guar polymers. It is thus respectfully submitted that the Lai, et al. single

prior art reference has not disclosed, and cannot disclose, each and every limitation of the amended claims. It is further respectfully submitted that the Examiner acknowledges this lack of disclosure by Lai, et al. because dependent claims 4, 11, 16 and 21 that further recite the polymer as a polysaccharide are not subject to this rejection.

It is respectfully submitted that for these reasons, the instant rejection is overcome and rendered moot. Reconsideration is respectfully requested.

35 U.S.C. §102 Rejection Based on Hall, et al.

The Examiner has rejected claims 1-23 under 35 U.S.C. 102(b), as being allegedly anticipated by U.S. Pat. No. 5,054,552 to Hall, et al.

The Examiner finds that Hall, et al. disclose the addition of oxidizers, ferrous ammonium sulfate and EDTA to a non-crosslinked xanthan gum gel as a breaker, referring to column 3, lines 8-27, the Examples and Tables 1 and 2. The Examiner finds that the concentration of the EDTA is within the claimed range based on a 1% use of the catalyst which equates to about 1.1 kg/m<sup>3</sup>. The Examiner further finds that the iron salt is added as a catalyst and not as a crosslinking agent. The Examiner notes that although some of Applicant's claims exclude the use of a crosslinker, the Applicant does not specifically define the scope of the crosslinkers to be excluded. The iron salts of the reference are added to the xanthan in the gel form for the purpose of breaking said gel. Finally, the Examiner finds that Applicant's claims do not exclude the further ingredients in the Hall, et al. reference by the use of the transition language "comprising".

The Examiner further remarks that the Applicant asserts that Hall, et al. must include oxidizers, organic acid and catalyst. The Examiner asserts that since the claims employ open language "comprising", the instant claims do not exclude said agents from also acting on the cross-linkers. The Examiner contends that since the reference discloses the use of each of the claimed steps and components plus additional components not excluded by the Applicant, said reference is deemed to anticipate the claims.

The Applicant must respectfully traverse.

It is again respectfully submitted that a patent claim is anticipated, and therefore invalid, only when a single prior art reference discloses each and every limitation of the

claim. *Glaxo Inc. v. Novopharm Ltd.*, *id.* As will be established, Hall, et al. also do not disclose each and every limitation of the rejected claims.

Hall, et al. teaches that "This invention comprises a breaker system for *xanthan gum* thickeners wherein a combination of at least two oxidizers, an organic acid, and at least two catalysts is used as a breaker for high viscosity aqueous fluids containing *xanthan gum*." (Emphasis added.) This excerpt is from the Summary, column 1, line 67 to column 2, line 3, but please also see the Abstract, claim 1 and elsewhere. To emphasize, the Examiner's attention is respectfully directed to the fact that Hall, et al. is *exclusively* directed to breaker systems for aqueous fluids containing xanthan gums (please see the title).

The Applicant would respectfully note that all of the independent claims herein have been amended to recite that the polymer gels are guar or derivatized guar polymers, as previously discussed. It is respectfully submitted that Hall, et al. do not and cannot teach methods of breaking guar or derivatized guar polymer gels. Indeed, it is respectfully noted that Hall, et al. explicitly distance their invention from guar or derivatized guar polymer gels. The Examiner's attention is respectfully directed to column 1, lines 54-58 of Hall, et al. which state, "While these [prior art] breakers are effective on most polysaccharide thickeners, such as *guar gum*, hydroxypropyl guar and locust bean gum, they are *not particularly effective on xanthan gum thickeners*." (Emphasis added.) It is thus further clear that Hall, et al.'s teachings are focused on and limited to xanthan gums and have no applicability to guar and derivatized guar polymer gels as now recited.

Because the Examiner has not shown that the single reference has disclosed each and every limitation of the claims, *i.e.* that the invention acts on guar or derivatized guar polymer gels, the subject rejection under 35 U.S.C. §102 cannot stand. Reconsideration is respectfully requested.

#### 35 U.S.C. §103 Rejection Based on Hall, et al.

The Examiner has rejected claims 1-23 under 35 U.S.C. 103(a), as being allegedly unpatentable over Hall, et al. for reasons of obviousness. The Examiner notes that Hall, et al. discloses *xanthan* gels as set forth in the above rejection. The Examiner incorporated said characterization herein by reference.

The Examiner further states that to the extent the concentrations for the EDTA differ from those exemplified in the Hall, et al. reference or the possible characterization of the ferrous salt as a crosslinker, Hall, et al. discloses (column 3, lines 59 *et seq.*) concentration ranges for the breaker agents.

The Examiner concludes that it allegedly would have been obvious for one having ordinary skill in the art at the time of Applicant's invention to vary the concentrations within the ranges taught in the Hall, et al. reference for the advantage of improved breaking of the xanthan gels.

Furthermore, the Examiner finds that Hall, et al. is silent regarding any crosslinking, there is no suggestion that the ferrous ions could crosslink the xanthan as employed in the Hall, et al. reference and the ferrous salt is characterized by Hall, et al. as a catalyst for the oxidation. One having ordinary skill in the art at the time of the invention would not have expected the ferrous salt and/or ion to function as a cross-linker, said cross-linker being excluded by the instant claims, the Examiner contends.

The Applicant must respectfully traverse.

It is again respectfully submitted that Hall, et al. is exclusively concerned with xanthan gums and does not teach or suggest anything with respect to guar or derivatized guar polymer gels, much less breaking said gels. As established in the discussion immediately above, all of the instant claims now recite that the polymer gel is a guar or derivatized guar polymer gel. The only thing that Hall, et al. teach with respect to guar is that breakers that are effective on guar polysaccharide thickeners are not particularly effective on xanthan gum thickeners.

Indeed, Hall, et al. teach away from the claimed invention since they teach that their invention concerns only xanthan gums. *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 230 U.S.P.Q. 81 (Fed. Cir. 1986), *on rehearing*, 231 U.S.P.Q. 160 (Fed. Cir. 1986) instructs that the inventor achieving the claimed invention by doing what those in the art suggested should not be done is a fact strongly probative of nonobviousness. An obviousness rejection cannot stand if the references teach away from the invention, *In re Hedges* 228 U.S.P.Q. 685, 687, 837 F.2d 473 (Fed. Cir. 1986). A reference which leads one of ordinary skill in the art away from the claimed invention cannot render it unpat-

entably obvious. *Dow Chemical Co. v. American Cyanamid Co.* 816 F.2d 617 2 U.S.P.Q.2d 1350 (Fed. Cir. 1987); *In re Grasselli, et al.*, 713 F.2d 731, 218 U.S.P.Q. 269 (Fed. Cir. 1983); *In re Dow Chemical Co.* 837 F.2d 469, 5 U.S.P.Q.2d 1529 (Fed. Cir. 1988).

The Examiner's attention is further respectfully directed to *In re Haruna, et al.*, 249 F.3d 1327, 1335; 58 U.S.P.Q. 2d 1517 (Fed. Cir. 2001):

"A prima facie case of obviousness can be rebutted if the applicant ... can show 'that the art in any material respect taught away' from the claimed invention." *In re Geisler*, 116 F.3d 1465, 1469, 43 U.S.P.Q.2d (BNA) 1362, 1365 (Fed. Cir. 1997) (quoting *In re Malagari*, 499 F.2d 1297, 1303, 182 U.S.P.Q. (BNA) 549, 533 (CCPA 1974)). "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, ... would be led in a direction divergent from the path that was taken by the applicant." *Tec Air, Inc. v. Denso Mfg. Mich. Inc.*, 192 F.3d 1353, 1360, 52 U.S.P.Q.2d (BNA) 1294, 1298 (Fed. Cir. 1999).

It is respectfully submitted that one having ordinary skill in the art at the time of the invention would not know that an aminocarboxylic acid (or salt thereof) could act directly to break down the *guar or derivatized guar* polymer gel of the invention in the face of the Hall, et al. art discussed above teaching away from the invention. It is thus respectfully submitted that a *prima facie* obviousness rejection has not been established with respect to any of the rejected claims over the reference. Reconsideration is respectfully requested.

#### Request for Entry of Amendment

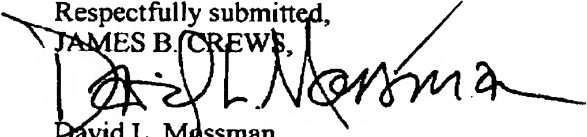
The Applicants would respectfully submit that the instant Amendment be entered under 37 CFR 1.116(b): "Amendments presenting rejected claims in better form for consideration on appeal may be admitted." It is respectfully noted that four claims have been canceled herein to reduce the total number of claims under consideration from 23 to 19. Further, the phrase "at least one guar or derivatized guar polymer capable of forming an aqueous gel" has been amended as noted to overcome one of the 35 U.S.C. §112, second paragraph, points of rejection. Additionally, the crosslinker in claims 15 and 20 has been further specified as a borate crosslinker to overcome the other 35 U.S.C. §112, second paragraph, point of rejection. It is thus respectfully submitted that all of the §112, second

paragraph, points of rejection have been overcome to narrow the issues present in the case. Further, the specifying of the polymer as a guar or derivatized guar derivative also permits the claims to overcome *all* of the art rejections. It is respectfully submitted that for all of these reasons, which simplify and narrow the issues, the instant Amendment should be entered.

Additionally or alternatively, the Applicants would respectfully submit that the instant amendment be entered under 37 CFR 1.116(c): "If amendments touching the merits of the application or patent under reexamination are presented after final rejection, or after appeal has been taken, or when such amendment might not otherwise be proper, they may be admitted upon showing of good and sufficient reasons why they are necessary and were not earlier presented." The Applicants submit that the reason why the amendments above and arguments below are necessary and were not earlier presented is simply because Examiner helpfully explained the rejections further, particularly the 35 U.S.C. §112, second paragraph, points of rejection, and these further explanations were not available prior to the final Action. For the Applicants to have any hope of being assured of a chance to fully address the instant rejections, the amendments and arguments herein must be entered and considered.

It is respectfully submitted that the arguments and amendments presented above overcome all of the instant rejections. Reconsideration and allowance of the claims are respectfully requested. The Examiner is respectfully reminded of his duty to indicate allowable subject matter. The Examiner is invited to call the Applicant's attorney at the number below for any reason, especially any reason that may help advance the prosecution.

Respectfully submitted,  
JAMES B. CREWS,

  
David L. Mossman  
Registration No. 29,570  
Attorney for Applicant  
Telephone No. 512/219-4026  
Facsimile No. 512/219-4036